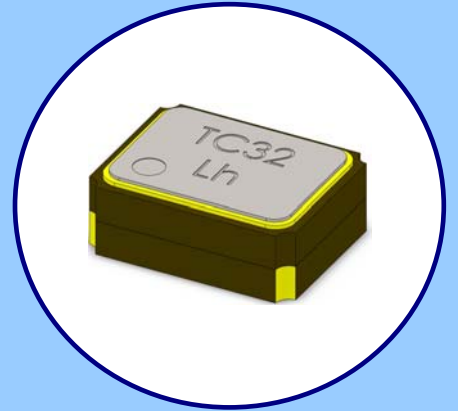




FEATURES

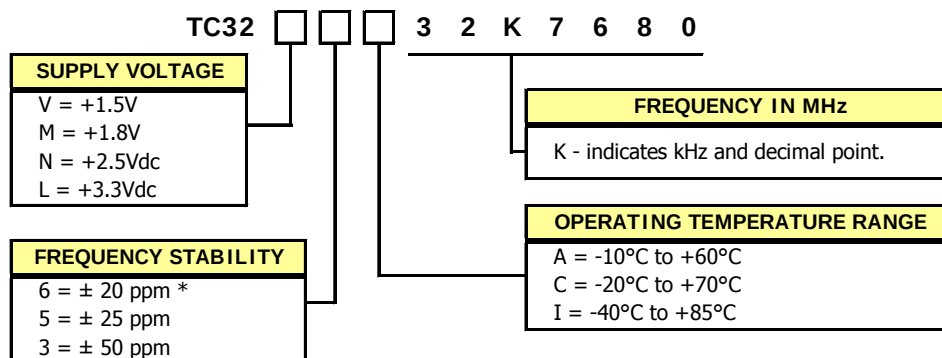
- 32.7680 kHz Frequency Reference
- Package Size 3.2mm x 2.5mm
- Fundamental Crystal Design
- Hermetic Ceramic Package
- Frequency Stability, ± 50 ppm Standard
- Operating Temperature, -40°C to $+85^{\circ}\text{C}$ Standard
- Tape & Reel Packaging, EAI-418
- **RoHS/Green Compliant [6/6]**



APPLICATIONS

Model TC32 is ideal for use in a wide range of communication equipment, measurement equipment, industrial applications, automotive electronics, wireless communications, PDAs, mobile phones and notebooks.

ORDERING INFORMATION



* Temperature codes A and C.

Example Part Numbers:

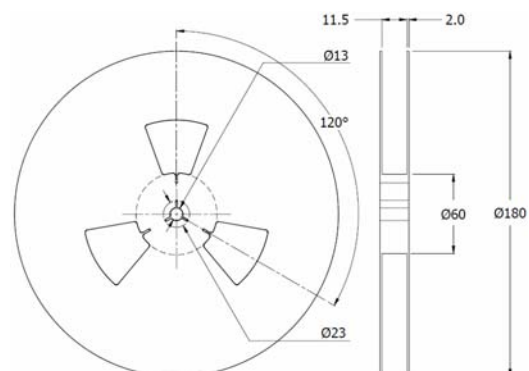
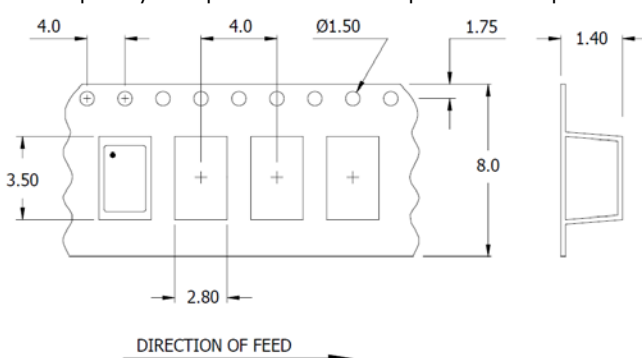
TC32L3I32K7680

TC32L5I32K7680

Not all performance combinations and frequencies may be available.
Contact your local CTS Representative or CTS Customer Service for availability.

PACKAGING INFORMATION [Reference Only]

Device quantity is 1k pcs minimum and 3k pcs. maximum per 180mm reel.

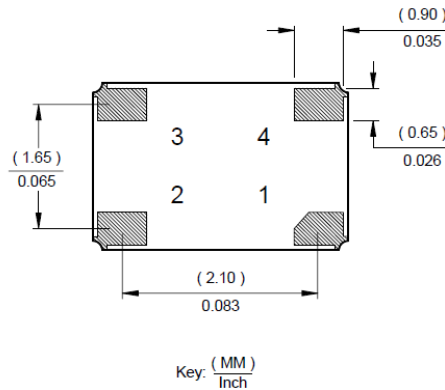
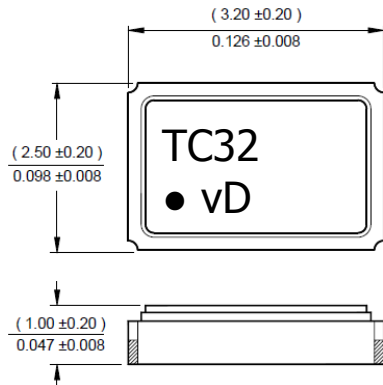


ELECTRICAL CHARACTERISTICS

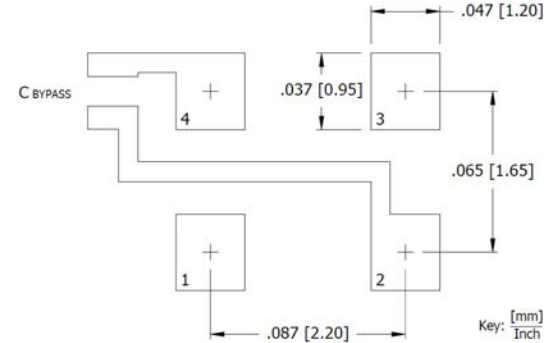
ELECTRICAL PARAMETERS	PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
	Frequency	f_o	-		32.7680		kHz
	Operating Mode	-	-	AT Fundamental			-
	Output Type	-	-	HCMOS			-
	Supply Voltage	V_{CC}	$\pm 10\%$	1.5, 1.8, 2.5, 3.3			V
	Current	I_{CC}	15pF Load	-	-	3.0	mA
	Frequency Stability	$\Delta f/f_o$	See Ordering Information	20, 25, 50			ppm
	Operating Temperature Range	T_A	-	-10	-	+60	°C
				-20	-	+70	
				-40	-	+85	
	Load Capacitance	C_L	CMOS	-	15	-	pF
	Output Voltage Levels						
	Logic '1' Level	V_{OH}	CMOS Load	0.9 V_{CC}	-	-	V
	Logic '0' Level	V_{OL}	CMOS Load	-	-	0.1 V_{CC}	
	Rise and Fall Time	T_{rr}, T_f	-	-	-	50	ns
	Output Duty Cycle	SYM	@ 50% Level	45	-	55	%
	Start-up Time	T_S	Application of V_{CC}	-	5.0	10	ms
	Enable Function						
	Enable Input Voltage	V_{IH}	Pin 1 Logic '1', Output Enabled	0.7 V_{CC}	-	-	V
	Disable Input Voltage	V_{IL}	Pin 1 Logic '0', Output Disabled	-	-	0.3 V_{CC}	
	Aging	$\Delta f/f_o$	@ +25°C, 1st year	-	3.0	5.0	± ppm
	Storage Temperature Range	T_{STR}	-	-55	-	+125	°C

MECHANICAL SPECIFICATIONS

TC32 PACKAGE DRAWING



SUGGESTED SOLDER PAD GEOMETRY



C_{BYPASS} should be $\geq 0.01 \mu F$.

MARKING INFORMATION

- TC32 – CTS Model Series.
- – Pin 1 identifier.
- v – Voltage code.
[L=3.3V, N=2.5V, M=1.8V, V=1.5V]
- D – Date code. See Table I for codes.

Complete CTS part number, frequency value, date code and manufacturing site code information must appear on reel and carton labels.

NOTES

- Termination pads (e4); barrier plating is nickel [Ni] with gold [Au] flash plate.
- Reflow conditions per JEDEC J-STD-020; 260°C maximum, 20 seconds.
- MSL = 1.

PIN ASSIGNMENTS

PIN	SYMBOL	DESCRIPTION
1	EOH	Enable Input
2	GND	Circuit & Package Ground
3	Output	RF Output
4	V_{CC}	Supply Voltage

TABLE I – DATE CODE

MONTH					JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
YEAR																
2001	2005	2009	2013	2017	A	B	C	D	E	F	G	H	J	K	L	M
2002	2006	2010	2014	2018	N	P	Q	R	S	T	U	V	W	X	Y	Z
2003	2007	2011	2015	2019	a	b	c	d	e	f	g	h	j	k	l	m
2004	2008	2012	2016	2020	n	p	q	r	s	t	u	v	w	x	y	z